Design of Radio Communication Control System for Robotic Applications

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The goal of this project is to successfully design, incorporate, and test a radio communication control system for a model radio controlled truck. As robotics technology advances, there is an increased need to develop wireless communication capabilities. This project makes use of two Peripheral Interface Controllers (PICs) intercommunicated using the ZigBee mesh protocol via Xbee modules. The final radio communication system allows the control of the truck's accelerator, break, and steering with the use of three potentiometers. The potentiometers are connected to the first PIC, which converts analog values to digital values and sends them to the first Xbee module. The Xbee module transmits the information to the second Xbee module, which process and transmit the information to the second PIC. The second PIC then takes that information and controls the electric motor and servo on the car according to what the user request. The final radio controlled system is tested on a truck in close environments and open terrains, where the truck can reach velocities of up to 40 miles per hour. This radio communication system is effective and simple to implement in other mechatronic devices, such as robotic football players and unmanned aerial vehicles.

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